



## Fisheries Monitoring Program

### Introduction

Shenandoah National Park has had a comprehensive fisheries monitoring program in place since 1982 with emphasis on developing an understanding of eastern brook trout population dynamics. Up until 1994, fisheries monitoring was conducted using qualitative procedures. These qualitative procedures included a number of shortcomings. In 1996, the program was officially switched to the current combination of quantitative and qualitative procedures. Beginning in 2005 the sampling effort was reduced to every other year in place of the annual regime.



*Brook trout (Salvelinus fontinalis) are a sought after native fish species for recreational fishermen in Shenandoah National Park.*

### Management Needs

Park fisheries are an important ecosystem component. Park populations of brook trout are also important because cold water fishery resources continue to be degraded by the establishment of exotic fishes the effects of acidification, and global warming.

The monitoring program provides a detailed view of fish population dynamics in response to flood or drought events, problems associated with stream acidification as well as concerns over fishing pressure in a large suite of park streams including all of those that are open for the legal harvest of trout.

### Current Procedures

Water temperature, pH, dissolved oxygen, conductivity, discharge, game fish species (length and weight), nongame fish species (count, minimum/maximum length and mass weight) and habitat are all measured at sampling sites. Habitat measurements including stream cross- section widths, water depth, substrate and pool/riffle ratios at 10 meter intervals throughout each stream transect are also gathered. Most transects are approximately 100m in length. There are a total of 103 sampling sites along 72 streams. Fifty- five or more quantitative (3- pass electrofishing) sites are sampled every two years. Sixty- three additional quantitative sites are sampled once every four to six years. The quantitative component includes sites along 15 streams stratified across the park's three dominant bedrock geologic formations and associated water chemistry ranges.



*National Park Service and Virginia Department of Game and Inland Fisheries personnel electrofishing the North Fork Moormans River, Albemarle County, June 2002.*

### What We Have Learned

We now have eleven years of quantitative data from 15 park streams that represent all of the ranges of size, slope, drainage, degrees of acid neutralizing capacity, species diversity and public use. Park staff members clearly have developed in- depth, firsthand knowledge of park fish resources. We know that we can detect changes in fish populations in streams that are sampled annually. It is less clear what the minimum threshold of change detection is, however, so power analysis of the sampling design would be prudent. It is also appropriate at this time to turn our attention to presentation of trends information.



## Fisheries Monitoring Program (continued...)

### References

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*Ivy Creek in Green County, sampled July 2004.*